

WHAT IS CLAIMED IS:

1. A substantially pure composition of mammalian megakaryocyte progenitor cells, wherein at least 80% of the cells in said composition are characterized as CD41<sup>+</sup>, CD9<sup>+</sup>, CD34<sup>+</sup>.
2. The composition according to Claim 1, wherein said cells are further characterized as lineage panel.
3. The composition according to Claim 2, wherein said lineage panel includes CD2; CD3; CD4; CD7; CD8; CD10; CD11b; CD14; CD19; CD20; CD56; and glycophorin A (GPA).
4. The composition of Claim 1, wherein said megakaryocyte progenitor cells, when cultured in methylcellulose in the presence of steel factor (SLF), flt-3 ligand (FL), interleukin (IL)-3, IL-11, GM-CSF, thrombopoietin (Tpo) and erythropoietin (Epo) give rise to megakaryocyte colonies.
5. The composition of Claim 1, wherein said megakaryocyte progenitors are mouse cells.
6. The composition of Claim 1, wherein said cells are genetically modified to comprise an exogenous DNA vector.
7. A method of enrichment for a composition of mammalian megakaryocyte progenitor cells, wherein at least 90% of the cells in said composition are characterized as CD41<sup>+</sup>, CD9<sup>+</sup>, CD34<sup>+</sup>, the method comprising:
  - combining reagents that specifically recognize CD41, CD9 and CD34 with a sample of hematopoietic cells; and
  - selecting for those cells that are CD41<sup>+</sup>, CD9<sup>+</sup>, CD34<sup>+</sup>, to provide an enriched population of cells having megakaryocyte progenitor activity.
8. The method according to Claim 7, wherein said sample of hematopoietic cells is bone marrow.
9. The method according to Claim 8, wherein said sample of hematopoietic cells is mobilized peripheral blood.

10. A method of screening for genetic sequences specifically expressed in cells committed to the megakaryocyte lineage, the method comprising:  
isolating RNA from a cell population according to Claim 1,  
generating a probe from said RNA,  
screening a population of nucleic acids for hybridization to said probe.
11. The method of Claim 10, wherein said cells are mouse cells.
12. A method of providing platelets to a mammalian recipient, the method comprising:  
administering to said recipient a population of megakaryocyte progenitor cells, wherein at least 80% of the cells in said population are characterized as CD41<sup>+</sup>, CD9<sup>+</sup>, CD34<sup>+</sup>;  
wherein said megakaryocyte progenitor cells give rise to platelets *in vivo*.
13. The method according to Claim 12, further comprising administration of thrombopoietin or a mimetic thereof in conjunction with said megakaryocyte progenitor cells.
14. A method of screening for factors that affect thrombopoiesis, the method comprising:  
combining a candidate thrombopoiesis factor with a population of megakaryocyte progenitor cells, wherein at least 80% of the cells in said population are characterized as CD41<sup>+</sup>, CD9<sup>+</sup>, CD34<sup>+</sup> and  
determining the effect of said agent on the formation of megakaryocytes and platelets.